

Notice of Allowability

Application No.

09/269,485

Examiner

Li B. Zhen

Applicant(s)

KUHN, EVA

Art Unit

2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response filed on May 12, 2004 and interview conducted on August 11, 2004.
2. ☒ The allowed claim(s) is/are 10-18, renumbered as claims 1-9.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☒ to Paper No./Mail Date 07/31/2002.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date August 11, 2004.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


MENG-ALT. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. W. William Park on August 11, 2004. The application has been amended according to an e-mail attachment from applicant's representative. Please refer to the printed attachment in the subsequent pages.

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (571) 272-3768. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2126

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Li B. Zhen
Examiner
Art Unit 2126

lbz
August 12, 2004


MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

The Abstract of the Disclosure

Please add the following paragraph as the Abstract of the Disclosure in the present application.

A peer-to-peer coordination system of distributed programs, services, and data is provided in a computer network where coordination servers run and serves local software systems. Some shared objects are communication objects to exchange messages and transactions. Only processes in reference to a communication object (administrated by replication strategies) are granted access via the local coordination server. The local software systems are capable of controlling transactions; creating, reading, and writing of communication objects; creating and supervising uniquely identified processes. Coordination servers have identical basic functionality for distributed object, transaction and process management, and taken together, form a global operating system. The network operates like a single global super computer and new processes and sites are dynamically added. The updateable objects has a non-resettable logical time stamp, is capable of storing data, and are coordinated by an optimistic concurrency control without utilizing explicit locks on the objects. The updateable object data is writeable on distributed peer nodes.

Amendments To The Claims
(In The Revised Format)

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1-9. (cancelled)

10. (currently amended) A ~~system for the~~ peer-to-peer coordination system of distributed programs, services and data by using application programs in a network of computers where coordination servers (CoKe) are running which serve local software systems (LSYS), where shared objects are used as communication objects to exchange messages and transactions are used to realized communication, said communication objects being uniquely identified by object identification numbers (OID), and only processes processing a reference to a communication object are granted access to it via the corresponding local coordination server, with the local software systems being at least extended by functions for the control of transactions, for the creation, reading and writing of communication objects, and for the creation and supervision of uniquely identified processes, and with the communication objects being administrated by means of replication strategies, wherein

all coordination servers ~~are~~ have identical ~~regarding their~~ basic functionality for distributed object, transaction and process management, and taken together, form a global operating system, so that the network of computers operates like a single global super computer where the

addition of new processes and sites is dynamic,

at least some of the objects are updateable objects having a non-resettable logical time stamp and capable of storing data, wherein the updateable objects are coordinated by an optimistic concurrency control without utilizing explicit locks on the objects and further wherein the data of the updateable object is writeable on distributed peer nodes, the functions provided for the extension of the local software systems provide a transactional blocking read of the updateable object and the processes are granted access to passed communication objects where different consistency models are supported for an updateable object, and distribution strategies are provided for the administration of communication objects, with the application programs not depending on said distribution strategies, and which distribution strategies are selectable at least with respect to the recoverability or non-recoverability of communication objects and processes.

11. (previously presented) A system according to Claim 10, wherein when choosing the respective distribution strategy, a basic strategy is selected in combination with additional, optional strategy flags.
12. (previously presented) A system according to Claim 11, wherein the local software systems can be started by the corresponding coordination server.
13. (previously presented) A system according to claim 12, wherein communication objects, to which no locally running process possesses a reference any more, are automatically cleared by the corresponding coordination

server or can be explicitly freed.

14. (previously presented) A system according to claim 13, wherein heterogeneous transactions or subtransactions are distributed to different sites (X,Y,Z) via the coordination servers which, taken together, behave as a global operating system.

15. (previously presented) A system according to claim 14, wherein a non-blocking transactional read is provided for updateable objects.

16. (previously presented) A system according to claim 14, wherein the writing into an object, the starting of a subtransaction, the distribution of part of a transaction to another site, the specification of a compensation action or of an on-commitment action are provided as transactional predicate.

17. (previously presented) A system according to claim 16, wherein an on-commitment action is started as a computation if it is sure that a transaction will commit.

18. (previously presented) A system according to claim 17, wherein among the functions for transactions a programmable backtracking of transactional operations, e.g. reading or writing of communication objects, is provided to be able to dynamically repair faults or failures in the transactions.

Specification

Please insert the following **subheadings** and a **paragraph** between lines 1 and 2 of the Specification page 1:

FIELD OF INVENTION

This application relates generally to a coordination system of programs and more particularly to a peer-to-peer coordination system of distributed programs.

BACKGROUND OF THE INVENTION

Please insert the following **subheading** between lines 16 and 7 of the Specification page 7:

SUMMARY OF THE INVENTION

Please insert the following **subheading** between lines 4 and 5 of the Specification page 16:

BRIEF DESCRIPTION OF THE DRAWINGS

Please insert the following **subheading** between lines 11 and 12 of the Specification page 17:

DETAILED DESCRIPTION

22/PRTS

L307860815

09/09485
416 Rec'd PCT/PTO 29 MAR 1999

Insert "Field of
Invention"

Coordination System

"Background of the
Invention"

8/12/04 dfg

The invention refers to a system for the coordination of distributed programs, services and data by using application programs in a network of computers where coordination servers are running which serve local software systems, where shared objects are used as communication objects to exchange messages and transactions are used to realize communication, and where the communication objects are uniquely identified by object identification numbers and only processes possessing a reference to a communication object are granted access to it via the corresponding local coordination server.

Objects generally refer to separate segments which may contain data as well as certain behaviours and communicate or cooperate, respectively, with the environment by exchanging messages. In particular, the environment means other objects. For example, clients (records), or bills and checks may form objects. Transaction on the other hand means a group of actions which usually must have certain properties, i.e. atomicity, consistency, isolation, and durability. The results of transactions must be protected against failures of any kind. In the literature, these properties are referred to as ACID-properties, and, in practice, they are of particular importance for database accesses, particularly if parallel and coordinated changes of

came from. At the root of the tree there is the primary copy of the communication object.

These hints in the above mentioned articles point in the right direction, but they do not yet allow a practical realization of the coordination of distributed software systems, service or data. These approaches particularly address the above mentioned disadvantages (a) to (e), but they do not give a solution for problems (f) to (k). Of these problems, problem (f) is of particular importance, because the argument that only optimal performance can only be achieved by low-level message passing or client/server oriented architectures - which, however, require more and more complicated implementation efforts - is the main reason why so far approaches based on shared objects did not achieve a break-through.

Therefore, the object of the present invention is to provide a new system of the above mentioned kind, which makes the realization of robust distributed applications, such as for example so-called business process modeling systems (work flow management systems), systems for distributed cooperative work (CSCW), multi database systems, distributed hypertext systems, etc., simpler and more reliable, avoiding above mentioned disadvantages of prior art approaches by special transaction mechanisms at the communication layer and the choice between several distribution strategies.

which, at least for the time being, are considered particularly advantageous, which, however, are not to be construed as limiting the invention, and with reference

insert "Brief Description to the figures wherein:
of the Drawings" →

Fig. 1 is a principle scheme illustrating a system wherein communication objects are available for autonomous local software systems in a global space;

Fig. 2 is a scheme illustrating the fundamental architecture of a configuration of computers at different sites, where the coordination servers installed at each site together form a global operating system;

Fig. 3 is a logical control scheme illustrating the basic operation of the coordination server, and thus of the global operating system;

Fig. 4 shows the treatment of local requests in a logical control scheme;

Fig. 5 shows the general control for the creation and inspection of communication objects;

Figs. 6 to 8 show the functions corresponding to Fig. 5 in form of flow charts;

Fig. 9 gives more details about the control flow of the transaction control shown in Fig. 4;

Figs. 10 to 16 show corresponding transactions;

Fig. 17 shows the control flow of transactional requests (according to Fig. 4) in greater detail;

Figs. 18 to 23 show the corresponding transactional requests (transaction manager) and the necessary subprocedures;

Fig. 24 shows the control for the process requests of Fig. 4, in greater detail;

Figs. 25 to 31 show the control flow of the corresponding processes which together form the process manager; and

Figs. 32 to 40 show the strategy manager, i.e., several procedures defining a so-called distribution strategy (a communication protocol).

insert

"Detailed Description"

ky 8/12/2004

Fig. 1 schematically illustrates different autonomous software systems (local software systems - LSYS) 1 to 7 which can be based on different traditional programming languages $P_1, P_2, P_3, \dots, P_{n-1}, P_n$ (for example C, Prolog, Lisp, Pascal, Fortran, Cobol, C++, etc.). The autonomous software systems 1 to 7 may be represented by concurrent processes, and each of them can be regarded as a uniquely defined system written in such a programming language, particularly, systems 1 to 7 can each be a local software system, each based on another programming language, so that these systems 1 to 7 cannot cooperate directly. (Theoretically it is possible that two systems interact directly - for the sake of simplicity, however, - these directly interacting systems are, regarded as one single system here, and optionally more systems, e.g. three, may be grouped together too).

Zhen, Li B

From: Park, William [william.park@ladas.net]
Sent: Wednesday, August 11, 2004 5:14 PM
To: Zhen, Li B
Subject: U.S. Serial 9/269,485 (Attorney Docket CU-1867)



2004-08-11 SN 9-269485
CU-1867...



2004-08-11 SN 9-269485
CU-1867...

Eva Kuhn et al.

U.S. Serial No. 9/269,485

Based on Austrian Application No. GM 573/96

Completion of PCT/AT97/00209

ATTN: Examiner Li B. ZHEN

GRP ART UNIT: 2126

Dear Examiner Zhen:

Thank you for your telephone call today.

In following up the conversation and as requested, attached herewith are:

- (1) The Abstract filed May 12, 2004;
- (2) The Claimed filed May 12, 2004; and
- (3) The amendment to the Specification for insertions of subheadings.

<<2004-08-11 SN 9-269485 CU-1867 Abstract & Claims of 5-12-04.doc>>

These were requested by the Examiner during the phone conversation today, and the Examiner is hereby authorized to enter them by an Examiner's amendment.

The following is a copy of applicable pages of the Specification to aid the Examiner in identifying the correct line numbers when making the Examiner's amendment pursuant to the Item (3) above.

<<2004-08-11 SN 9-269485 CU-1867 Spec pgs 1,7,16-17.pdf>>

As indicated during the phone conversation, we would await the issuance of a Notice of Allowance of the present application in the next action.

Please contact the undersigned attorney if there are any matters to be discussed further.

✓ Applicants thank the Examiner for his effort and cooperation.

Very truly yours,

W. William Park
Attorney at Law

Ladas & Parry, LLP
224 South Michigan Avenue, Suite 1200
Chicago, Illinois 60604
Office: (312) 427-1300 (ext. 257)
Fax: (312) 427-6663 & 6668
Email: william.park@ladas.net
www.ladas.com

The information contained in this email correspondence is strictly confidential. If you have received this e-mail in error, please treat it as being confidential, and please notify us. Thank you.